

LVIII.—On the Variation of the Weasel (*Putorius nivalis*, Linn.). By Dr. EINAR LÖNNBERG.

IN the 'Annals' for January last, Mr. G. E. H. Barrett-Hamilton communicated an interesting "Note on the Weasel, *Putorius (Ictis) nivalis*, Linn., and some of its Subspecies," in which he seems inclined to subdivide the species in question into a number of "subspecies." I do not dispute the fact that some of these may be found to be valid and distinct enough to deserve subspecific rank, but I believe this can hardly be the case with all of them. Of course, the idea as to the meaning of a subspecies varies somewhat with different authors. I suppose, however, that even in a subspecies the distinguishing characteristics (although they are of less importance than specific ones) must be constant to a certain degree and inherited from one generation to another; in the opposite case it is only an individual variety. Such independent individual varieties must not be called subspecies, in my opinion, even if they are numerous and dominate in some region. In his introduction Mr. Barrett-Hamilton says: "In the far north, as is well known, the weasel regularly turns white in winter, and this character is in itself sufficient to warrant the subspecific separation of those individuals whose winter coat is white from those which, as in England, do not undergo such a seasonal change of colour." I am not inclined to accept this statement under present circumstances for reasons given below.

Mr. Barrett-Hamilton recognizes as the first "subspecies" "*Putorius nivalis typicus*, Linnæus: type locality, Upsala, Sweden"; and the second is "*Putorius nivalis vulgaris*, Erxleben: type locality, Leipzig." The difference between these subspecies appears to be that the former turns white in winter, the latter does not. If any sharp geographical boundary-lines could be drawn between these forms, the probability for their separation would increase. Such, however, is not the case. In the northern and middle parts of Sweden the weasel regularly turns white in winter. In Scania, the most southern province, on the other hand, all weasels are brown during the winter. This has already been pointed out by Sven Nilsson in his various memoirs on Swedish mammals, but he says he does not know the northern limit of those weasels which are brown in winter. Later authors, as, for instance, Lilljeborg, do not add anything to our knowledge on this subject. According to the literature,

the Scanian weasels should, then, belong to the subspecies "*Putorius nivalis vulgaris*," but the weasels inhabiting other parts of Sweden should be termed "*P. n. typicus*."

The subject, however, is not so simple. I have before me now a male specimen killed on the 10th of January this year in the neighbourhood of Jönköping in the province of Småland. This is brown above and white beneath. The line of demarcation between the colours is well defined, but wavy. The white colour extends over the upper lips nearly to the ears, but behind the angle of the mouth is a brown spot in the white. The inner side of the legs is white, the outer side brown. The hind feet have only a few white hairs at the tip of the toes, but the fore feet have white toes. The white colour of the belly does not reach the anus. On the flanks some brown-coloured spots are nearly detached and surrounded by white. Length of head and body 210 mm., of tail 55, of hind foot (without claws) 30 mm. I think this specimen should be regarded as an example of "*Putorius nivalis vulgaris*." I remember also very distinctly that some years ago I saw a weasel in brown winter-coat killed still further north, at a place called Vallsnäs, not far from the town of Linköping, in the province of Östergötland. In reply to a question on this subject, Dr. A. Stuxberg informs me that the Museum of Gothenburg possesses not less than three specimens of weasel with brown winter-coat, namely: (1) a specimen from Mölnlycke, a little south of Gothenburg, killed 15th Jan., 1899; (2) a specimen from Hemsjö in Vestergötland, near the town of Alingsås, killed 5th Feb., 1899; and (3) a specimen from the neighbourhood of Gothenburg, killed 16th March, 1897. From all these statements the conclusion can be drawn that the "*vulgaris*" form occurs together with the "*typicus*" form in the provinces of Öster- and Vestergötland and Småland, so far as the colour of the winter-coat is concerned. This becomes more interesting because it forms a parallel to the occurrence of the "bluish-grey" ("*canescens*," Nilsson) and the white variety of the northern hare. In Scania the "*canescens*" variety dominates. In Småland, Öster- and Vestergötland both forms occur mixed, but in Upland and the northern provinces, on the other hand, the white variety dominates. The occurrence also of the brown weasel and the "blue" hare seems to correspond to the time during which the ground is covered with snow. In Scania where the ground is covered with snow only 45-48 days each winter, the white forms are absent or extremely scarce, and it is at least questionable whether a white coat would be of pro-

tective value in such a case, when more than half the winter a white coat would be exposed against a dark background. In northern Vestergötland the ground is covered with snow for about 72 days, and in Östergötland for about 85 days. In those provinces the white coat is certainly more beneficial, although not to such a degree as in Upland, with 103 days of snow-covered ground, and still more further north (Lapland, with 189 days). The climate seems, therefore, to afford an explanation why in the north all weasels turn white, in the south none do so, while in an intermediate region they occasionally turn white, and sometimes remain brown during the winter. But when there is no sharp limit, neither geographical nor climatological, and the brown and white weasels occur mixed in the intermediate tracts, I cannot regard the establishing of a subspecific distinction on the difference in colour well founded. With regard to size, the weasels, as is well known, are subject to very great variation. This is shown in the most evident manner by Hensel's valuable paper\* "*Craniologische Studien.*" As regards the present species, this author informs us that the basal length of skulls of male weasels varies from 39·8 to 32·4 mm., and their breadth over the zygomatic arches from 25 to 18·1 mm. The great variation in size of the skull of the weasel becomes evident from the following table:—

	Number of speci- mens.	Cranial length.		Breadth.		
		max.	min.	max.	min.	
"vulgaris."	English weasels	16 ♂	41	36·5	25	21·5
	( <i>Barrett-Hamilton</i> ) . . . .	8 ♀	34	31	19	16·5
	German weasels ( <i>Hensel</i> ) .	48 ♂	39·8	32·4	25·1	18·1
		15 ♀	32·7	27·4	18·4	15·0
	Scanian weasels (in the Museum of Lund accord- ing to a communication from Dr. O. Holmquist).	2 (sex un- known).	36	31	20	15
"typicus."	Uplandic weasels (in the Museum of Upsala, <i>Lönn- berg</i> ) . . . . .	6 (sex un- known).	32·5	26	18·5	15

This seems to indicate that the English weasels are perhaps rather larger than those of the Continent, and that

\* Nov. Act. Acad. Leop.-Carol. Nat. Cur. t. xlii. (Halle, 1881).

towards the north the size diminishes. The maximum of one group, however, surpasses the minimum of another group. When such is the case, the variation in size seems also to form a continuous series, which, I am sure, will prove still more continuous when further material is obtained.

Although the distinguishing characteristics derived from size also are thus rendered unimportant, the variation of the weasel certainly does not lack significance, because intermediate stages occur which unite the extreme forms.

LIX.—*New Species of Mollusca of the Genera Voluta, Conus, Siphonalia, and Euthria.* By G. B. SOWERBY, F.L.S.

[Plate XI.]

THE types are in the British Museum (Natural History).

1. *Voluta uniplicata*, sp. n. (Pl. XI. fig. 1.)

Testa fusiformis, tenuis, pallida, utrinque acuminata, in medio convexa: spira pyramidata, mediocriter longa: sutura anguste canaliculata: anfractus (5-6?), supra breviter concavo-depressi, deinde convexi. undique longitudinaliter filo-striati, spiraliter dense decussatim striati, plicis longitudinalibus numerosis, in ultimo subobsoletis instructi; anfractus ultimus oblongus spiram multo superans, supra obtusissime angulatus, supra angulum subplanato declivis, infra convexus, basim versus attenuatus: apertura ampla, fauce nitens, rufo-carnea; labrum tenue vix reflexum; columella tenuis, plica unica alba lentissime contorta instructa; area polita columellari late effusa, rufo-aurantia.

Long. (circ.) 200, maj. diam. 82 mm.

*Hab.* Japan.

I have seen only one shell of this remarkable species; the apex is unfortunately broken off, so that the description is necessarily incomplete, although the shell is otherwise in perfect condition. It is of a light structure, sculptured with close spiral striae, which are more prominent on the upper part of the whorls; the whorls of the spire are closely and regularly longitudinally plicate, but the plicae become irregular and almost obsolete on the body-whorl. The whole interior, including the lip, is lustrous pinkish red, and a thin shining enamel of orange-red covering the columella is spread half across the whorl. The columella is furnished with a single well-defined plait, which is long, narrow, and but